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Mexico

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The call for modernization has been the single most important factor in bringing telecommunications into the forefront of policy attention in Mexico since the late 1980s. This point was made clear when Carlos Salinas de Gortari stated, very early in his 1988 presidential campaign, that "telecommunications will become the cornerstone of the program to modernize Mexico's economy." Salinas followed through on his campaign pledge by restructuring the telecom agencies, reinterpreting the legal framework, and reprivatizing the telephone monopoly. He thereby implemented a liberalization strategy for accelerating modernization of the telecommunications sector.

It is commonplace that modern economies require access to extensive and sophisticated communications networks, and Mexico has undeniably lacked the requisite infrastructure. Thus, enhancing the competitiveness of the economy became another major theme driving the telecommunications agenda during the Salinas administration, especially during the North American Free Trade Agreement (NAFTA) campaign. The implementation of NAFTA codifies and clarifies specific telecom issues, such as access to and use of public networks, standards-related measures, and technical cooperation. It also eliminates restrictions on enhanced services, protects intellectual property rights, and, perhaps most significantly, liberalizes trade in services.

Liberalizing trade in data services, in particular, opens new opportunities for Mexico's industrial development, supporting both the growing service sector and the more traditional manufacturing sector. Jaime Serra Puche, the former secretary of trade and industrial development and Mexico's chief architect of NAFTA, observed that "Mexico has a great future in data services. Mexico has more engineers per capita than the U.S. and can offer sophisticated data services, such as software programming, as well as low skilled services, such as data entry" (Griffith 1992, p. 55).

For Mexico to be able to develop, market, and support data services adequately in a competitive international marketplace, the country's information infrastructure must rapidly merge the full capabilities of telecommunications and computers in the context of global networks. This is the challenge for President Ernesto Zedillo Ponce de Leon's administration, which took office in December 1994.

Joint ventures and other strategic partnerships are being formed by major international communications companies and deep-pocketed firms owned by Mexican billionaires. Indeed, five of Mexico's ten billionaires on the 1995 *Forbes* listing of the world's richest people are communications magnates. These ties may well position Mexico to lead Latin America in the Global Information Infrastructure (GII) and to attain a competitive advantage in the global economy through the use of cutting-edge information technology and services.

Mexico's challenges of achieving modernization and competitiveness are shaping the national telecommunications industry. This chapter looks at the roots of these challenges by first outlining the history of telecommunications in Mexico, identifying aspects of telecommunications unique to the country, and then describing the present situation and possible scenarios. A review of the legal framework affecting the industry and the organizational structure of the sector complete the background for an analysis of the policy-making process and the players involved. This analysis is presented in the context of how Mexico can better prepare for sustainability in the wake of the economic crisis of 1995.

13.1 Background

Mexico is the second most populated Latin American country. During and immediately after World War II, the country underwent rapid industrialization, accompanied by rapid urbanization and explosive population growth. The population was slightly over 14 million in 1920, about what it had been at the beginning of the century (there had been a decline during the 1910s because of violence associated with the Revolution), about 70 percent of whom lived in communities of fewer than 2,500 people. There are now over 92 million (July 1994 estimate), only 30 percent "rural." Slightly more than half of the population is considered economically active, defined as age twelve or older and available for work.

Mexico's almost 2 million square kilometers are diverse terrain: desert, mountains, canyons, and jungles. Almost half the country is covered by the Mexican Plateau, over 2,100 meters in elevation, which is bordered by mountains that parallel the coasts. Mexico City, the nation's capital, sits at an elevation of 2,240 meters and, with a metropolitan-area population of over 20 million, is the world's largest urban conglomeration.

Mexico's economy has been based on petroleum, which was originally developed by foreign interests and nationalized in 1938. Mexico has decreased its dependency on oil substantially since the 1982 collapse of oil prices. That year, oil accounted for 75 percent of exports; its share had fallen to below 32 percent in 1992. (For more on Mexico's state-owned oil company, Pemex, see Aspin 1995.) During the early 1980s, the *maquiladora* industry emerged as Mexico's second most important source of export income.¹

A federal republic with a strong executive branch, Mexico has been dominated by the Institutional Revolutionary Party (PRI) and its precursor since 1928. This date marks the achievement of political stability, through a consolidation of politi-

cal interest, after eighteen years of bloodshed and disruption during the Mexican Revolution. The political unrest of the 1990s has facilitated the increased influence of an opposition party, the National Action Party (PAN). As of 1997 the PRI has lost any placement in the Mexican Government and currently has no political power.

13.2 Early Development

Modern telecommunications in Mexico begins with the Spanish immigrant Juan de la Granja, who, on May 10, 1849, obtained an exclusive concession to introduce telegraphy. On November 5, 1851, de la Granja and his associate William George Stewart began service between Mexico City and Nopalucan, Puebla, a distance of 180 kilometers. In 1852 a line between Mexico City and Veracruz, on the Gulf of Mexico, was completed, and by 1854 the first Mexican telegraph operators had been trained. International service was initiated on November 16, 1867, by a concession granted to an affiliate of Western Union Telegraph. (A comprehensive history of telegraphy in Mexico is in SCT 1987.)

During the decade 1877–87 Mexico achieved significant communications growth. Major developments included extension of the telegraph network from 9,000 to 40,000 kilometers and construction of an average of 700 kilometers of railroad a year.

The first telephone connection, between Mexico City and Tlalpan, a distance of 16 kilometers, was made on March 13, 1878. Nine months later telephone service was officially established by Alfred Westrup and Company for six police stations, the Office of General Inspection, the Mayor's Office, and the Ministry of Interior.

Western Union Telegraph continued to aggressively pursue opportunities in Mexico, and in 1896 agreement was reached for its subsidiary, Compania del Cable, to function as the intermediary dispatch for international traffic. A year later a contract was signed between Compania Telegrafica Mexicana and Western Union for the operation of Mexico's international telegraph service. By 1901 the country's telegraph network had grown to comprise 47,828 kilometers owned by the federal government, 12,036 kilometers by the railroads, 6,917 kilometers by state governments, and 3,942 kilometers by private enterprise (SCT 1987, p. 263).

In 1903 radiotelegraph stations were installed in Baja California for communication across the Gulf of California (Mar de Cortes). Other stations were subsequently built in various coastal regions of the country until 1911, for radiotelegraphy developed rapidly in response to national security matters related to the eruption of the Mexican Revolution in 1910. In 1919, as the Revolution's violence ebbed, development intensified again with the modernization of the national radiotelegraph network, including the addition of new stations and the exchange of messages with Germany and Chile. Radiotelephony and other radio communications services, such as mobile land services, also were initiated.

13.2.1 *The Role of the State*

Within the first few years of the introduction of telegraphy, the state began taking an active role in the development of domestic telecom policy. President Benito Juárez was interested in accelerating construction of telegraph lines and in 1855 and 1861 expedited decrees to promote their development. On November 3, 1867, tariffs for telegraph lines appeared in the Mexican government's *Diario Oficial* for the first time and, the same year, its Rules on Railroads established the intimate relationship between the train and telegraph systems. By 1869 the Rules for Telegraph Offices were established. On July 1, 1891, the secretary of communications and public works was created and took over control of the federal telegraph lines from the secretary of development. The director-general of Federal Telegraphs facilitated the expansion of communications infrastructure, negotiating contracts for the construction of new federal lines. Mexico participated in the 1906 International Radiotelegraphic Convention and began to play a role in international telecom forums and regimes as well.

The 1917 Mexican Constitution declared telegraphy and other means of communications a monopoly of the state, including the exclusive management and control of facilities. This did not, however, mean private parties could not participate: for example, private broadcasting was allowed at designated frequencies under rules setting limits on power and establishing fees. The 1926 Law of Electrical Communications required permits or concessions from the government for use of channels and radio frequencies.

The 1938 Law of General Means of Communications requires the national telecommunications industry to be under the control of the SCT (Secretaría de Comunicaciones y Transportes) for national security purposes. The SCT formulates and conducts policies to promote a modern telecom system and establishes supply, coverage, and rates that are adequate to the country's needs. In addition, it has the authority to plan, administer, and control the utilization of the radioelectric spectrum and the media in which electromagnetic waves are broadcast. Also, under the 1938 law, it had the exclusive power to provide a wide range of public telecom services. As discussed later, since 1992 SCT has been reorganized into the telecom regulatory agency, with operating responsibilities transferred to a separate state enterprise called Telecomunicaciones de Mexico (Telecomm).

13.2.2 *Early Telephone Service*

In 1881 the U.S. businessman M. L. Greenwood was granted a concession to install a telephone network in Mexico City. The next year he acquired new concessions to expand the services of Compañía Telefonica Continental. The first company on national territory was called Mexican National Bell Telephone, but it never provided service because of conflicts among several diverse interests. Mexico had become a favorable place for foreign investment under the Porfirio Díaz regime (1877–1911), and many investors were vying to provide telephone service. Their conflict was resolved by the formation of a new company under Greenwood and three other foreign partners on July 18, 1882. Their firm was called Compañía

Telefonica Mexicana (Mextelco), and it was technically and financially supported by Western Electric Telephone Company. By the end of the year long-distance service was established between Veracruz and New York City, and by 1883 subterranean routes and ducts were being constructed in Mexico City.

In 1903 Mextelco was granted a new contract to continue service in Mexico City, and by 1905 it had increased its capital and modified its name to Compañia Telefonica y Telegrafica Mexicana. Also in 1905, L. M. Ericsson was granted a concession. It began service with 500 subscribers under the name La Empresa de Telefonos Ericsson in 1907.

The telephone played its first historic role in the nation's political life during the "tragic ten" days (*decena tragica*, February 9–18, 1913) of the Mexican Revolution when President Francisco I. Madero was informed by telephone that General Bernardo Reyes had gone with his troops to the National Palace with the intention of taking it over and denouncing the government.

The Revolution adversely affected the advancement of telephony in Mexico because of the physical destruction it caused and because U.S. capital was unwelcome at a time when Woodrow Wilson's regime was meddling in Mexico's internal affairs.²

By 1915 Compañia Telefonica and Telegrafica Mexicana was operating under government intervention. The company also began having serious problems with its workforce. In the meantime, Ericsson worked normally and was able to inaugurate the first automatic central telephone, known as Rome central, in 1924. Within two years, Ericsson had the capacity to connect 10,000 lines.

By 1924 government intervention had ceased and Compañia Telefonica y Telegrafica Mexicana was acquired by International Telephone and Telegraph (ITT). The deal was even more attractive for ITT after the secretary of communications and public works modified the company's concession, including an extension of fifty years. Under ITT control the company was able to regain its position in the market vis-à-vis Ericsson.

By 1936 the government acknowledged that, in the public interest, the two incompatible phone networks needed to unite and expressed this desire to the competing companies. To advance the process, the 1940 Communications Law legally obligated the companies to comply. The precedent set by the oil expropriation of 1938 and the leftist populist rule of President Lazaro Cardenas beginning in 1940 provided further impetus. The following decade witnessed intense activity by the Telephone Workers Union and restrictive pricing policies by government regulators. Thus, the two companies ultimately were sufficiently motivated to collaborate on a unification package that would appeal to the government, as well as adequately compensate their parent companies.

13.3 Telmex

Telmex (Telefonos de Mexico, SA de CV) was officially established on December 23, 1947, by the merger of the country's two telephone systems. The new company was 51.24 percent owned by Continental Corporation, 48.75 percent by

Ericsson, and the remainder by three Mexican companies. The agreement stipulated that between 1948 and 1957 Telmex would pay Ericsson 2.5 percent of gross annual income and 3 percent afterward. Between 1950 and 1958 Telmex was consolidated and capitalized as the principal telephone company in the country. It was also "Mexicanized," becoming majority Mexican-owned in 1958, although foreign capital remained welcome—in 1960 a stock offering was held in the United States. (The company's official history is recounted in *Telefonos de Mexico* 1991; Szekely 1995 is a publication subsidized by Telmex that provides a history of the company since privatization for potential investors.)

The 1956 rule of priorities for capitalization of the company included the provision that those who bought shares in Telmex received priority for installation of new service. (During its early days, AT&T had a similar policy in the United States.) In effect, this meant one had to buy shares in order to acquire a line. This practice explains the huge growth in the number of shares of the company and remained in effect until late 1990.

In 1972, by acquiring a 51 percent equity holding, the government gained control of Telmex's development strategy. The secretary of communications and transportation presided over the board of directors until reprivatization in December 1990 and then participated as a board member from 1991 to 1994. The 49 percent of shares remaining in private hands traded publicly on the Mexican Bolsa and the New York Stock Exchange (as ADRs).

In 1976 SCT increased Telmex's value by extending its concession by thirty years to 2006, with a possible twenty-year extension after that.

Telmex has a regional affiliate, Telnor (*Telefonos del Noroeste*), which covers the state of Baja California and the northeast of Sonora up to Sonoyta. Service in the area had been provided by a private concessionaire who was operating a racket selling lines on the black market. He quickly discontinued investment in the company when it seemed likely to be taken over by the government. Consequently, the region fell greatly behind the rest of the country in telecom development during the mid-1970s. Expropriation came in 1978.

In response to the region's industrial development needs, including the growing *maquiladora* industry, the government began an aggressive investment program. After great success in digitalizing the region, Telnor evolved into a model for Telmex to follow for its management style and more flexible labor contracts. Relative to Telmex, Telnor has higher productivity and faster response times, in part because of its better labor relations. The companies have remained separate because of differences in their labor contracts.

13.4 System Development from 1948 to 1985

By the late 1940s the Mexican government had determined that the nation's telecommunications infrastructure and service were insufficient. Hence, the government implemented the Miguel Aleman Plan during 1947–1952. The SCT built new land telegraph lines, modernized twelve radio transmission stations, and completed ten radio stations for transmission and reception. Further, it undertook

plans for direct communications with Europe, completed arrangements for radiotelegraph and radiotelephone service with Central America, Venezuela, Colombia, and Ecuador, and initiated similar measures with Chile, Uruguay, Brazil, and Argentina. Among the achievements, the number of federal telegraph, telephone, and radiotelephone offices reached 1,236, staffed by 6,800 employees.

Telmex's creation spawned a rapid expansion of telephone service, as well as competitive systems within the government. The SCT controlled the telegraph and its microwave network and competed with Telmex's public telephone system. In 1952 Telmex installed a microwave link between Mexico City and Puebla with twenty-three telephone channels. To facilitate domestic manufacture of telecom equipment, in 1956 Telmex created Industria de Telecomunicaciones SA (Indetel) with capital from Ericsson and ITT. Telex was introduced between the capital and Acapulco in 1957.

After the initial microwave station had operated on an experimental basis, additional stations were installed to improve the transmission system. Mountainous terrain made installation and maintenance very costly. The first network covered the southern part of the country. By 1959 there were 1,500 kilometers of microwave links in Mexico, including Telmex's public network and a government network used by Pemex & CFE (Comision Federal de Electricidad, the state-owned electric utility). Pemex and CFE eventually operated their own private networks.

Telmex installed a microwave system in 1962 to enhance its automatic long-distance exchange service. By 1963 Telmex's microwave system extended from Mexico City through Monterrey to San Antonio, Texas. Also in 1963, for the first time, live broadcasts were made via SCT's national microwave network: the trip of President Adolfo Lopez Mateos to Europe and the launching of astronaut Gordon Cooper into space. These transmissions illustrated the capabilities of global communications and thus provided an impetus for accelerating technological change for the XIX Olympics, scheduled to be held in Mexico City in 1968.

In the mid-1960s the government was motivated to initiate a National Telecommunications Program, including establishment of a National Microwave Network and a plan to eventually install its own satellite system. Telephone density in Mexico in 1965 was comparable to Spain and Korea. Over the next three years Telmex installed DDD (direct distance dialing, *Lada* in Spanish) on a national level, and by 1968 the microwave network linked the principal cities, primarily on routes radiating from Mexico City.

The Olympic games were broadcast to more than 700 million people in almost seventy countries by radio, television, telegraph, and radiotelephone. Satellite transmissions were provided by Intelsat and Domsat. Mexico's dependency on these foreign-owned satellites strengthened the pressure from the powerful media conglomerate Televisa on the government to finance a national satellite system.

In 1968, ten years after Mexicanization, there were 725,000 operating telephones in the country. In 1970 Mexico inaugurated its Lada 95 service with a call to Washington, D.C. In 1979 Telmex introduced digital systems into Mexico and also its Integrated Digital Network (RDI), an overlay network for the traditional telephone network. After 1983 the first digital lines were functioning and repre-

sented a major step in the modernization of the system. Lada 800 service was introduced in 1988 and facilitated the first electronic videoconferencing, utilizing RDI. In the mid-1980s Telmex was allowed to provide data services.

Telmex restructured during the late 1980s, splitting into six regions in an effort to decentralize the company. In 1993 it restructured into three regions—north, central, and south—as Telmex's first reaction toward competition. However, the regional operation structure was paralyzed by central investment decisions. Without the power to commit resources, the regions lacked real independent marketing and management. The organization of Telmex has reflected a basic lack of marketing focus since its inception.

The development of telecommunications was severely restricted after 1982 because the economic crisis limited resources. Many structural problems arose from the catastrophe of the 1985 Mexico City earthquake. By 1990 Telmex had debt equal to 23 percent of its capital.

13.4.1 Satellites

In December 1982 a modification of Article 28 of the Constitution designated satellite communication as a strategic area under the exclusive charge of the state. This was President Miguel de la Madrid's response to his predecessor's contract with Hughes Communications International for a new satellite system and private media conglomerate Televisa's increasing pressure for more control over the system.

In 1985 the Morelos Satellite System was launched by Hughes for the Mexican government. The Morelos System consisted of two geosynchronous satellites, each with twenty-two transponders using both Ku-band and C-band. Although the government accomplished a speedy implementation of satellite technology to meet the growing demands of the two primary users, Televisa and the telecom agency DGT (Dirección General de Telecomunicaciones), it did not adequately utilize or develop the social applications promised in the promotional campaign for the project, nor the commercial applications offered by the technology. Indeed, for over half its working life, Morelos I did not operate at capacity. In mid-1995 Morelos II was still not filled to capacity, even though its life may end during 1997–98. Morelos was underutilized for three reasons: tariffs were high, the regulatory framework was restricted, and the technology of the earth stations was not well developed. VSAT (very small aperture terminal) technology allowed more access.

A reinterpretation of the Mexican Constitution ultimately allowed the emergence of private VSAT networks as a popular solution for intracorporate telecom needs and for governmental commercialization of the underutilized bandwidth on Morelos. A precedent was set when the first private cross-border VSAT network was established to connect Honeywell's Tijuana plant with a corporate office in Gardena, California, in 1989. Subsequently, VSAT networks became very popular along the border and in rural areas of Mexico. Also during 1989, privately owned ground stations were allowed for private-sector use of the Morelos satellites. International links with foreign satellites still had to donate ground stations to the government. Sharehops and teleports were authorized on the condition they *not* be used to transport public switched service.

13.5 Pressure for Change

Many factors have influenced the changes in Mexico's telecommunications policies since the mid-1980s, not the least of which are external forces. Mexico's adherence to the General Agreement on Tariffs and Trade (GATT) in August 1986 led to such measures as lowering tariffs to a maximum of 20 percent, removing import license requirements for telecom equipment, eliminating official import reference prices on all but fifty-three categories of goods, and eliminating a 5 percent surcharge on imports. The pressure for free trade in services within GATT motivated price restructuring for telephone service and allowed entry of alternative international carriers in 1989. Thus, the Secretariat of Trade and Industry (SECOFI) facilitated importation of information technology and enhanced Mexico's competitiveness even before NAFTA.

Telmex's ability to build up communications services had reached its limit by the early 1980s. The company's investment program was affected because demand became overwhelming and the government began to lose favor. With over 1.5 million telephone applications pending and a significant deterioration in the quality of service, the company was forced to undergo massive reorganization and decentralization. Until the late 1980s the government had not made Telmex's growth a clear objective, since there was not an awareness of telecommunications' role in economic and social development.

Telmex employees faced negative publicity as the media launched a direct attack on the company's inefficiency. A public opinion poll—conducted by Telmex, SCT, the Secretariat of Labor and Social Prevision (STPS), and the telephone workers' union and first reported as an advertisement in a leading newspaper (*El Financiero*, October 16, 1987)—found that general corruption among Telmex employees was widely seen as having exacerbated the company's inability to give adequate service. It was commonly believed that the union had been instrumental in handicapping the growth of the company through prolonged strikes, personal political battles, and sabotage. At the same time, rumors circulated that many nonunion employees engaged in sabotage and blamed it on union employees.

Unable to forestall or prevent privatization, the union ultimately negotiated a 5 percent equity position in the deal and has provided strong political support for the company since.

Users emerged as aggressive demanders of change in the system in the late 1980s. Their role as key players in defining policy was unprecedented; previously their interests usually had been subordinated to those of government agencies, the telephone workers' union, and the service and equipment providers. In fact, one of the most important users, Pemex, was allowed to construct its own private network. Due to the pressure exerted by users, not least by various governmental secretariats, the government finally acknowledged that priority had to be given to telecommunications for the country's modernization and competitiveness (Griffith 1989b, p. 552).

Three factors influenced the decline of Telmex before privatization. First, during the financial crisis of the 1980s, the government reduced investment in

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Telmex. Prior to the oil and debt crisis of 1982, 50 percent of revenue from the telephone tax was obliged to be reinvested in Telmex. This policy ceased under crisis. Second, an historic decision of 1981 positioned Mexico as one of the first countries to digitalize its telecom system. However, this plan was complicated by the technological failure of the digital system introduced by ITT (System 12) through an international bid. The software did not work and ITT could not meet the deadline. Subsequently, ITT sold its telecom equipment business to Alcatel and Ericsson, which ultimately replaced ITT. Third, the 1985 earthquake in Mexico City caused the loss of all long-distance capability in the capital city and much of the country due to the dependency on the central switch.

Since the late 1980s the growth of the *maquiladora* industry has led to rapidly growing demand for improved services along the border with the United States. Telmex's large-user department initiated the company's first efforts to commercialize services, with a focus on this booming industry. By 1989 special services offered in the border cities of Ciudad Juarez, Nogales, Reynosa, Nuevo Laredo, and Matamoros included digital Pulse Code Modulation (PCM) systems, digital microwave links, and fiber-optic systems for local and national use, as well as international connections. Points of connection originated in industrial parks and manufacturing plants.

Cellular phones and CB radios became another popular solution for voice communications during the late 1980s. Although expensive, cellular phones were desirable because of the long delays in otherwise acquiring phone service. Many operations actually found cellular systems more cost efficient for international connections, even though cellular systems were originally deemed illegal for transborder communication. In 1992, eight agreements regulating telecommunications along the border were signed between the United States and Mexico, as discussed later.

In 1980 the country's second digital exchange was installed in Tijuana, and the regional operating telco, Telnor, successfully digitalized much of the local telephone system in Baja California during the following decade. By 1989 Mexicali and Tijuana each had over 76 percent of their local area networks digitalized. In fact, Telnor's early regional success prompted its parent Telmex to decentralize into three regions in an attempt to improve service. By 1993 Telnor had completely digitalized telephone plants in the urban zones parts of its service area. Telnor's region boasted a density of 13 lines per 100 inhabitants by mid-1995, having increased the number of installed lines by 64 percent and the number of lines in service by 51 percent since the beginning of privatization (de Murguía 1995, p. 7E).

13.6 Regulation and Policy Changes

Until the late 1980s telecom regulation in Mexico had been pursued to achieve several goals, each of which implied a different role for the state. These goals sought to limit profits, allocate resources efficiently, maximize the size of the networks, and maximize government revenues (Griffith 1989b, pp. 548-49). Subsequently, a radical departure from this formula has occurred.

By 1987 Telmex was reversing the government-imposed populist approach to service by increasing local and medium-range service rates about 16 percent faster than long-distance rates. Previously, Mexico's local rates were among the cheapest in the world, subsidized by long-distance rates that were among the most expensive.

An early initiative of the Salinas administration (1988–94) was to restructure the government agencies involved in telecommunications as a precursor to deregulation and privatization. Until 1989 SCT had divided telecommunications into telephone service, primarily provided by Telmex as a monopoly, and all other types of communications. The latter were controlled by an agency of SCT called the General Directorate of Telecommunications (DGT). Under this structure, DGT and Telmex were the two policy-making forces that influenced SCT in defining telecommunications in Mexico.

After restructuring, SCT continued to regulate telecommunications, granting concessions and permits, as well as providing telecom services such as operating the national satellite system. Three undersecretariats were established to fulfill its mandate: (1) Transportation and Infrastructure, (2) Communications, and (3) Technological Development. There are also two autonomous agencies that SCT uses to provide telecom services: Telecommunications of Mexico (Telecomm) and Navigational Services in the Mexican Air Space (Seneam). The Mexican Institute of Communications (IMC) serves in an advisory capacity for communications issues.

Quite important was the removal of a constitutional obstacle. Mexican policy makers changed the legal framework through a reinterpretation of the law, rather than the lengthy process of amending the Constitution. For example, in March 1989 SCT's restrictions on transborder satellite communications links were withdrawn. International links were reinterpreted to refer only to cross-border satellite connections using systems *other* than the national Morelos Satellite System. This allowed Telecomm to issue domestic permits to anyone using Morelos for private, intracorporate networks. Technically, the law provides for government control over all satellite use, and all ground stations belong to the Mexican government. Satellite users have to purchase hardware for their networks, donate it to the government, and then lease back 50 percent of the capacity—the government retains the other half.

Mexico's previous protective policies had hindered the development of satellite services because the government did not invest in earth stations, nor would it allow the private sector to have ownership rights. Consequently, Morelos operated below capacity for years. Once Telecomm began to commercialize services under new rules allowing private ownership, full capacity was reached within a short period. In particular, VSAT usage in the border region became popular for establishing private intracorporate networks.

The 1995 Telecom Law has provided an even broader interpretation, including a provision for the privatization of the Solidaridad Satellite System launched in the early 1990s. Privatization will allow for more efficient utilization and management of the satellite network, space segment, and value-added services.

In connection with the Telmex privatization, President Salinas issued the Regulations for Telecommunications in 1990, which defined for legal purposes many of the services and technical terms used in the field. Also, these new regulations (published in the *Official Daily* on October 29, 1990) authorized SCT to grant competitors of Telmex concessions for public telephone networks, either for specific regions or specific services. The regulations protect Telmex's monopoly over long-distance service until August 1996 and classify providers into two categories: concessionaires of public telecom networks and licensees of private networks, value-added services, and other services that utilize public networks.

Policy makers responded to the rapidly growing demand for compatibility along the border with the signing of eight U.S.-Mexico Border Telecommunications Agreements in 1992. These were designed to better coordinate operations and assign radio and cellular frequencies on a reciprocal basis in the region. They also provide for new services and thus include technical specifications for cellular telephones, data transmission, communications services for highway and railroad transportation, television via microwaves and satellite, and high-definition television. Cellular telephone subscribers gained legal permission to use their phones on either side of the border. Also, an administrative agreement protects frequencies used by the International Boundaries and Waters Commission (IBWC). This is designed to prevent radio interference.

Mexico's most significant economic policy decision of the twentieth century has been to establish a regional trade partnership with the United States and Canada. The North American Free Trade Agreement (NAFTA) is a model agreement for its unprecedented opening of trade in services and its substantial contribution to competitiveness. Implementation of NAFTA on January 1, 1994, immediately opened additional opportunities for U.S. and Canadian exports of telecommunications equipment to Mexico and improves opportunities for U.S. and Canadian companies to provide enhanced services in Mexico, a market expected to have grown from U.S.\$22 million in 1991 to over U.S.\$100 million in 1995. Prospects for Mexican exports of enhanced services, which totaled U.S.\$27 million in 1990, also improve under NAFTA. The agreement eliminated investment restrictions in most enhanced services immediately and eliminated all investment and other restrictions on videotext and packet-switched services in July 1995. (See Griffith 1994 for more on telecom trade issues; see De la Calle 1994 for a discussion of improved market access and prospective benefits.)

Mexico's Foreign Investment Law places certain restrictions on investment in common carrier services by limiting foreign investment to 49 percent equity ownership. Although NAFTA generally lifts this foreign ownership restriction and requires national treatment, basic telecom providers are exempt from NAFTA.

The 1995 Telecommunications Law replaces the previously prevailing legal code. The law outlines the introduction, beginning in 1997, of full competition in all segments of telecommunications. The SCT must confront difficult regulatory issues concerning universal service, access charge levels, and equal access as it moves to a fully competitive multicarrier environment.

13.7 Partial Privatization

In 1987 the government decided to partially privatize Telmex. It was a very controversial decision and was not immediately announced to the public. The telephone workers' union, which represented more than 90 percent of Telmex employees in 1989, was the greatest source of opposition to privatization, which it saw as a threat to its overwhelming power within the company. A rapid deterioration of labor relations ensued, but immediately before privatization, relations had improved and President Salinas lauded the company's labor contract as a model for reaching productivity goals.

Although the union failed to stop privatization, it did gain a 5 percent equity position to appease its leaders. The union has subsequently grown to 52,000 members industrywide and remains a significant political force in the development of telecommunications policy. At the end of 1994, the company employed 48,810, approximately 82 percent of whom were unionized. There were 5.9 employees per 1,000 lines in service, an improvement of 10.6 percent from 1993.

Since private-sector interests took control, Telmex no longer has a role in the regulatory process. However, it is commonly understood that the company continued to influence policy during the Salinas administration due to the long-standing relationships established when the company was part of the public sector and the close friendship of President Salinas and Telmex's president, Carlos Slim Helu, the head of Grupo Carso who became a billionaire under Salinas. The sweetheart deal under Salinas is increasingly coming under public scrutiny.

13.7.1 *The New Telmex*

In December 1990 the government sold control of Telmex to a consortium of Grupo Carso, Southwestern Bell (now SBC Communications), and France Telecom for U.S.\$1.76 billion. At that time, the secretary of communications and transportation ceased being board chair but remained a board member until 1994. The government sold almost all of its remaining interest in global stock offerings in May 1991 and May 1992, taking in almost U.S.\$1.8 billion; it disposed of its final stake in a privately placed convertible bond offering in May 1994.

Telmex's capital structure reflects the need to have access to large amounts of foreign equity capital even while retaining voting control in the hands of Mexican nationals. Thus, the company has three classes of common stock, each with different voting rights but otherwise the same. Two of these were issued in connection with the 1990 privatization: the AA (sold to the consortium and thus having full voting rights and representing 22.11 percent of Telmex equity) and the L series (sold in the global offerings and having limited voting rights, representing 74.25 percent). Series A shares (representing 3.64 percent), which also have full voting rights, are those that were previously in private hands.

In 1996, Telmex posted earnings of \$1.476 billion and sales of \$6.708 billion. Telmex's earnings were the second highest of any company in Latin America, behind only Telebras de Brasil. Telmex continues to operate the largest local and

ng-distance network in Mexico. It has \$6.6 billion in annual revenues and serves nearly 9 million residential and business customers. In spite of losing monopoly control in January, Telmex has been able to hang onto the majority of Mexico's long-distance market. Although many users are choosing AT&T and MCI alliances on local ballots, most telephone users have not voted and will therefore remain with Telmex. The company's executives claim 90 percent of Mexico has voted not to switch carriers. Telmex believes it is keeping customers because of its lower rates, national coverage, and quality service. In early 1997, Telmex charged 3 cents a minute for the access fee to use its lines. Industry analysts expect long-distance prices to drop 20–30 percent.

Grupo Carso is the biggest single owner of controlling shares with 20.5 percent of the voting rights (while SBC holds 10 percent and France Telecom holds 5 percent) and 40 percent equity ownership, mostly through holding AA shares. The remaining majority of voting power is held primarily by other Mexican nationals, as of year-end 1995.

Telmex Series A and L shares trade publicly in Mexico and the United States as ADSs (American Depositary Shares). In 1994 the ADSs representing L shares were the most actively traded issue on the New York Stock Exchange, with over 1 billion changing hands, a record for any company. The AA shares are restricted by the original terms and cannot be traded before 2001.

13.7.2 The Concession

The concession remains effective until March 10, 2026, and allows Telmex to provide voice, data, text, sound, and video transmission services. It also required that telephone service reach several goals by 1994, including: basic services in all communities with more than 500 inhabitants; automatic switching services for all communities with more than 5,000 inhabitants; and two public (pay) telephones for each 1,000 persons (and five per person by 1998). The company also must have provided regulators with its four-year working plan. Since 1996 automatic switching must be provided in all communities with at least 100 requests for it and improvement must be made in the quality of service, particularly as regards responding to reported failures.

The company is allowed to offer additional services such as cellular telephony, radiotelephony, and television signal distribution and to manufacture telecom, computer, and electronics equipment. Telmex is allowed a monopoly of long-distance service until 1997, when new firms will be allowed to compete with it. As discussed later, cellular service was open to competition in 1989. The federal microwave network was sold to Telmex in 1991 as part of the concession for domestic long distance.

13.7.3 New Investment, Large Profits

Telmex's capital spending has increased dramatically since the partial privatization. In 1989 it invested less than U.S.\$500 million; in 1991, the year after privati-

zation, the figure was over U.S.\$2.75 billion. For the six years 1991-96, the total was U.S.\$12 billion, including U.S.\$1.3 billion for telephone equipment, U.S.\$2.7 billion for transmission equipment, U.S.\$3.9 billion for switches and power equipment, and U.S.\$3.7 billion for outside plant. Most of this has been to work off the backlog of requests for new service at the time of privatization and otherwise meet the requirements of the concession.

The privatized Telmex spent \$12 billion laying more than 18,000 miles (28,000 kilometers) of fiber-optic cable, increasing the number of telephone lines in the country by 66 percent, from 5.3 million lines to 8.8 million. It extended phone services to 25,000 small towns and boosted the extent of the network's digitalization—compression of sounds into high-speed transmissions—from 30 percent to 90 percent.

Density has reached 9.6 lines per 100 inhabitants, up from 6.5. As a result, the wait for a new line dropped from three years to less than three months. The number of public (pay) phones has tripled, to approximately 240,000, with at least one in every locality with more than 500 inhabitants except in the area of conflict in Chiapas.

Revenue (in pesos) increased over 115 percent from 1990 to 1993. Aided by tariff schedules designed to allow it to generate cash for improving and expanding the system, in 1993 the company had a U.S.\$2.7 billion net profit on U.S.\$7.9 billion in revenue. Telmex's operating margins of over 50 percent (before the 1994-95 economic crisis) were among the highest in the world, which originally motivated some forty firms to seek to compete with Telmex in 1997, when its monopoly is terminated. By year-end 1994, debt was just 15 percent of Telmex's capital compared with, for example, AT&T's 39 percent, Telecom Chile's 44 percent, and Telefónica de España's 54 percent.

The economic crisis that began in December 1994 negatively affected the company. Telmex raised rates 12 percent in March 1995, but increases are not expected to catch up with the accelerated pace of inflation in its costs. Revenue actually declined in the second quarter of 1995 compared with 1994. The peso's 1994-95 devaluation meant higher debt and debt-service costs measured in pesos—about 60 percent of Telmex's foreign debt is in U.S. dollars and 25 percent in Japanese yen—leading to a reported U.S.\$65 million loss in the first quarter of 1995.

In October 1994 Telmex made a major statement of its intention to compete in multimedia services by announcing plans to acquire 49 percent of Empresas Cablevision SA, a subsidiary of Grupo Televisa SA. Cablevision began operations in 1969, offering transmission of point-to-point television. In mid-1995 it had some 210,000 subscribers for its twenty-four-channel basic service; the company also offered seven premium channels. With about a 20 percent share of the domestic cable market, it was much smaller than market-leader Multivision.

The controversial deal was approved in June 1995, despite questions by senior legislators in all three major political parties and challenges raised by companies planning to compete against Telmex in 1997. As a condition, Cablevision must give access to other telephone companies if its cable network (more than 7,000 kilometers) is open to telephone service.

Media conglomerate Televisa controls more than 85 percent of Mexico's television market and is the primary producer of Spanish-language programs in the world, with concessions for distribution rights in fifty-two countries, including China and the former Soviet Union. It is owned by the Azcarraga family, led by Emilio Azcarraga, who also dominates Direct-to-home (DTH) television, music, film, magazines, and advertising, as well as owning a newspaper, two football (soccer) teams, the Aztec Stadium, and an equity share in Panamsat. During the early 1990s Televisa and Venevision acquired the majority participation in Univision that is allowed for foreign investors in the United States.

13.8 Other Players

In March 1992 SCT signed an agreement with Hughes for the construction of two satellites to replace the Morelos system. Solidaridad I was launched in November 1993 and Solidaridad II in October 1994. The government leases space to users. Each has eighteen transponders in band C, sixteen in Ku, and two in L for mobile telephony. Band C will be used for television, voice, and data; Ku, for digital data networks and DTH satellite television. Introduced in Mexico for the first time, band L is expected ultimately to have 50,000 mobile users and 20,000 stationary users. The Solidarity system has a life of fourteen years, and its footprint includes the major cities of the American continents. Solidaridad's two goals are to spur television, trade, and industry and to provide communication to all rural areas. The May 1995 Telecom Law provides for privatization of the system. Under privatization, nonsatellite services such as telegraph, telex, and wire transfers will likely be linked to the post office, similar to the European experience.

13.8.1 Telecomm

Telecomunicaciones de Mexico (Telecomm) is a key operator of telecom activities in Mexico. It was created in November 1989 as a decentralized government agency to provide diverse services, including telegraph, radiotelegraph, public fax, satellite services, a satellite data network called Infosat, a packet-switched data network called Telepac, and an electronic mail service called Infonet. It thus took over many of the functions of DGT. Regulations reserved telegraph and satellite transmission services to the state, while opening other services to the private sector and competition. Telecomm has continued to strive for increased autonomy and financial self-sufficiency through commercialization of its services.

As the second largest user of equipment, Telecomm is responsible for the telegraph network with 1,600 offices. In 1994, over 5 million telegrams were sent, and the number of wire transfers increased to contribute 25.6 percent of telecommunications revenues. Money wire transfers provide 90 percent of revenue for telegraph service, which is available in 1,500 cities. Telex is available in 120 cities connected by 82 central offices with 24,663 lines. In 1990 Telecomm initiated a program to renovate installations offering services that include public telephone, fax, and telex.

In 1994 Telecomm had revenues of U.S.\$267 million, 43 percent from satellite

services (Valerdi 1995). Now that the 1995 Telecom Law allows privatization of the satellite system, the future of Telecomm is unclear. Included in the privatization is Morelos II (which is being considered for repositioning to extend its life beyond the current 1997-98 limit); Solidaridad I and Solidaridad II, with lives extending to 2007-9; orbital slots for direct broadcast satellite (DBS); transmit/receive (T/R) ground stations in Mexico; landing rights in Latin America and the United States; and agreements for interconnection with U.S. teleports, low earth-orbiting satellites (LEOs), personal communication service (PCS), and Ka-band, which is primarily for television. Another agreement with Hughes provides for the manufacture of another satellite, Morelos III, to be launched in 1998.

The primary domestic companies interested in bidding on the satellite system include Multivision, Televisa, Avantel, Alestra, and Redsat. Among the U.S. operators forming U.S.-Mexican teams and bids for various holdings are Lockheed Martin Corp. (teamed with Televisa), Hughes Electronics Corp. unit of General Motors Corp., Loral Space Communications Ltd., and the GE Americom unit of General Electric Co. Some assets will be sold by late summer 1997, and others will be sold by the end of the year. The DBS license could climb as high as \$500 million, while the remaining assets could attract an equal amount.

13.8.2 Grupo Iusacell

Telmex's most serious competitor, and one of the most dynamic players in Mexico today, is Grupo Iusa, headed by the powerful Peralta family. Since 1965, when the Mexican government granted Iusacell a fifty-year concession to provide basic telephony service for select rural and suburban areas throughout Mexico, the company has been aggressively staking out markets in Mexico and the rest of Latin America.

Iusacell is the second largest cellular operator in Mexico, after Telcel, a Telmex subsidiary. Its franchises cover more than 70 percent of the population and it holds a nationwide 450 MHz license for unspecified services. The company operates a switched data company, Iusanet, and offers private line bypass through Satellitron. Microwave facilities and fiber-optic capacity leased from the CFE (Comision Federal de Electricidad) support its operations. In 1993 Iusacell had an estimated 150,000 cellular subscribers, spending an average of U.S.\$200 per month. The group had net income of U.S.\$40 million from telecom revenues of U.S.\$400 million, as part of a U.S.\$1.7 billion industry group.

In 1994 Bell Atlantic purchased 42 percent of Iusacell in a transaction valued at almost U.S.\$1.04 billion. Consistent with Mexican law, voting control remains with the Peralta family. However, Bell Atlantic has been promised it will be able to participate in key business decisions based on its economic interest in Iusacell. Grupo Iusacell completed an international initial offering of 9 percent of its stock in 1994; shares trade on the New York Stock Exchange as well as in Mexico. The new long-distance concession is called Iusater, SA de CV.

During the same year, Iusacell entered a partnership with equipment manufacturer Northern Telecom for joint education and training. The program calls for more than 6,000 Iusacell staff members to receive management, sales, marketing and distribution training in preparation for growth in communications markets.

13.8.3 Sprint

Sprint has been a player in Mexico since 1987 when it sponsored a forum at the University of California's Center for U.S.-Mexican Studies that challenged Mexican policy makers to privatize the phone company. Sprint initially maintained a low-key role, but it has been very effective in negotiating numerous contracts with Telmex and its regional subsidiary Telnor. Illustrating their excellent rapport, Sprint and Telmex formed a joint venture in late 1994. The agreement was actually a major coup for Telmex because Sprint withdrew from an alliance with Iusacell-Bell Atlantic to form the partnership. The alliance allows Telmex to compete as a global player, offering seamless cross-border products and services to corporate accounts.

Sprint's other clients in Mexico include AeroMexico, Banamex, Bancreser, Cecoban, Cifra (Mexico's largest retailer), Compania de Luz, Grupo Autrey, Pemex, PMI Comercio Internacional, and Telecomm. Sprint began offering service in late 1989, and in 1995 included IDDD, operator services, Sprint Express, Mexico Directo, Meeting Channel, ITFS, IVPN, and private lines.

Ongoing facilities, product, and service quality development programs are in place with Telmex. The Sprint-Telmex network includes over 2,000 circuits at four fiber-optic border crossings: Tijuana-San Isidro, California; Reynosa-McAllen, Texas; Juarez-El Paso, Texas; and Nogales-Nogales, Arizona. The Sprint partnership will allow Telmex to leverage the common platform of technology products and services as part of preparing for future competition. Telmex also has an option to align with and benefit from the Sprint alliance with Deutsche Telekom and France Telecom and with Call-Net of Canada for development of a global telecommunications network known as Global One. The Sprint joint venture will allow Telmex to compete as a global player offering seamless cross-border products and/or services to multinational corporate accounts.

In February 1997, Telmex and Sprint announced another joint venture to market long-distance service to the growing Hispanic market in the United States. The newly formed company filed an application under Section 214 of the Communications Act with the FCC for authority to carry international traffic to and from the United States. It plans to cater to the special needs of the large and influential Hispanic population by offering conveniently packaged calling plans and products.

13.8.4 Others

Although its position may be eroding, AT&T remains one of the most significant international forces in Mexico. It was the sole provider of international long-distance telephone service until 1989, but it has since been under pressure from the other common carriers allowed to provide service, including Sprint, MCI, and LDDS. As a strategic move to better position itself to face this competition, AT&T Telecom Mexico Inc. joined forces with two large Mexican firms, including Alfa Telecom S.A. de C.V. of Monterrey, to form Alestra S.A. Grupo Alfa is a powerful industrial conglomerate with major interests in steel.

In preparation for the opening of the domestic long-distance market, Grupo

Financiero Banamex-Accival, Mexico's largest financial group, became the first company to apply for and receive a long-distance license. In October 1994, it entered a joint venture with MCI Communications Corporation. The new company, Avantel S.A., is 55 percent owned by Banamex. Based in Mexico City, the venture expects to have much of the necessary infrastructure in place by 1997 and to have invested U.S.\$2 billion in the new network by the year 2002. During 1995-96 Avantel spent U.S.\$650 million on the first stage of a fiber-optic network. An additional U.S.\$1.15 billion will create a 19,200-kilometer fiber-optic network, focusing on corridors from Mexico City to Monterrey and Guadalajara. In early 1997, Avantel was granted a \$481 million 13-year loan by the Export-Import Bank in the United States and the Export Credit Development of Canada (EDC) to support its telecommunications investment plan. Avantel launched its service with Ahorrafacil program, featuring highly competitive rates for domestic long-distance calls. Avantel also offers special rates for international calls made within a strip along the border (50 miles south and 55 miles north of the border). Within the next five to seven years, Avantel expects to capture 20 percent of the market with its fiber-optic network. Since 1975 Banamex has been creating Infracel (Infraestructura de Telecomunicaciones), Mexico's largest private telecom network, which serves 250 cities. Banamex has a permit to offer as much as 30 percent of its network capability for private services.

Bancomer, Banamex's most serious banking competitor, joined forces with the holding company Valores Industriales, S.A. (Visa) in 1994 to form Unicom Telecomunicaciones S. de R.L. de C.V. They are launching a firm to offer value-added services not available from Telmex, such as interconnections and videotext transmission. The company will also build infrastructure for long-distance telephone service. Bancomer and Visa already have a private infrastructure utilizing satellite, microwave, and public networks.

Two other concessions have been granted, to Marcatel and Investcom, to foster competition with Telmex. Marcatel is the consortium made up of Radio Beep, Western International, and IXC Communications. With at least six companies investing over U.S.\$800 million each, SCT anticipates a total investment in telecommunications of U.S.\$5 billion over a five-year period, 1996-2000.

Arthur Andersen won the contract to handle the complicated accounting of all telephone traffic between the United States and Mexico. The number of calls between the two countries is probably the highest worldwide. For example, there were 2.4 billion minutes of calls between Mexico and the United States in 1994. U.S.-Mexico traffic is a \$4 billion annual long-distance market that could grow to \$11 billion within the next five years. To allow competition to reach its full potential, an accurate account of calls made to Mexico through AT&T, MCI, Sprint, and the more than 400 smaller operating companies in the United States is vital to ensure that the calls will be assigned proportionally to the eight Mexican competitors.

13.8.5 Equipment Suppliers

Domestic producers of telecom equipment include Alcatel, AT&T, Ericsson, GPT (a Pleussy marketing arm), Mitel, Northern Telecom, Siemens, TPS (a Phillips

subsidiary), and some small Japanese and Korean firms located along the Baja California border.

Grupo Ericsson is the longest surviving telecommunications company in Mexico, with operations dating back to 1907, when it initiated telephone service. Ericsson became a major shareholder of Telmex when it was formed in 1947 by merging the country's operating companies. It subsequently disposed of its stake but continued to be Telmex's principal supplier. Ericsson produces central office switches, power equipment, and transmission equipment and also assembles radio equipment for Telcel. It is developing software for both the Mexican market and common applications for Ericsson worldwide, in particular for the U.S. market. This is significant because of the importance of software in modern central office switches. Approximately 70 percent of Grupo Ericsson's sales are to Telmex (1993 data). Exports to Central America account for 12 percent of total sales; other 3 percent go to the United States and Europe. A little over 10 percent of Telmex's purchases are from L. M. Ericsson and its affiliates, and 10 percent of L. M. Ericsson's worldwide sales are to Telmex.

Imports, almost half from the United States, accounted for about 60 percent of Mexico's U.S.\$2.5 billion equipment market in 1993. The overall market was expected to grow at 10 percent during 1994-96, with import growth projected at 8 percent as a larger share was served by domestic production. Equipment made in the United States has been highly regarded due to its quality, price, delivery time, and high technology. Strong technical assistance to the client has been an additional factor for U.S. product popularity (Gutierrez 1994).

2.9 Nonbasic Services

Rights to offer cellular telephony were first auctioned in 1989, and the response has been overwhelming due to the lack of adequate basic phone service. Mexico has been divided into nine cellular regions. Each has two providers, Telcel and a competitor. Estimates for the end of 1994 indicate 400,000 subscribers in over 85 cities, with Mexico City having at least 60 percent of them. Much social status is associated with having a cellular phone.

Paging has been available since the early 1950s and had approximately 77,000 subscribers in 1993. As elsewhere, paging is popular among the medical profession and companies providing maintenance service. In 1991 Televisa entered a joint venture with Mobile Telecommunications Technologies Corp. (MTel), offering satellite paging services.

Value-added services (VASs) are defined by the 1995 Telecom Law as "services that employ a public telecommunications network and that affect the format, content, code, protocol, storage, or similar aspects of the information transmitted to any user, as well as provide users with additional, different, or restructured information, or involve interaction of a user with stored information."

Enhanced services have generally come to be interpreted to include VASs and information services. In Mexico, both are regulated as value-added services. The VASs usually comprise telex (with store and forward features), e-mail, voice mail,

protocol conversion, videotext, packet switching, and video conferencing. Information services include databases, on-line computer services, information brokers, and the like. Enhanced services such as e-mail and voice mail are among the fastest growing sectors of the telecom industry.

Some private networks, such as CFE and Banamex, have been granted permits to share their network with other users. Private networks have been established by Televisa, Cifra, Electronic Data Systems (EDS), and the Mexican Petroleum Institute (IMP).

Beginning in 1995 U.S. and Canadian investors have been able to own 100 percent of a Mexican enterprise that provides value-added services, including videotext and enhanced packet-switching services.

13.10 Looking Ahead

Mexican telecommunications have undergone significant liberalization since the late 1980s, and more is planned. One aspect of privatizing Telmex has been the breakup of its monopolies. Telmex's long-distance telephone monopoly ended in 1996, and its general monopoly will be completely terminated by 2026. Telecom's monopoly of the national Solidaridad Satellite System is being eliminated in 1997 as well. Competition has already been allowed in cellular services, paging, videotext, radio, voice mail, cable television, and value-added services through the granting of concessions to new entrants.

The terms of deregulation will define how the industry will look as the century ends, and it will influence overall foreign direct investment in Mexico. In fact, the *Wall Street Journal* observed, "Telmex is so important to Mexico that how the government decides to deregulate will be the most important policy move since the decision to proceed with the North American Free Trade Agreement" (Torres 1994). As of June 1994 approximately U.S.\$18 billion of foreign money had been invested in Telmex. At that time, the company's stock made up 18 percent of the Mexican stock market's total capitalization and 23 percent of daily trading volume. By the end of 1996, Telmex had been the most actively traded stock on Wall Street for the previous two years. It accounted for about a quarter of the value of the Mexican stock exchange and has spawned the maxim, As Telmex goes, so goes the economy.

The economic crisis that began with the devaluation of the Mexican peso on December 19, 1994, devastated Telmex's share price. Series L shares traded in New York fell to a low of U.S.\$23 on March 11, 1995, less than their initial offering price of U.S.\$27.25 in May 1991 and 76 percent below their high of U.S.\$75.50 on February 8, 1994.

Yet, the crisis did not lead to a major reprioritization of the terms of deregulation. Before the devaluation, SCT had announced interconnection guidelines favorable to new entrants as regards open markets entry, number of interconnection points, and ability to bypass. Legislation in 1995 revealed the ultimate two objectives: to motivate the participation of the greatest number of businesses of various sizes in existing markets and subsequent spin-off markets; and to rapidly

pass on the benefits of modernization in the sector in the form of new services at competitive prices for all consumers.

To meet the challenges of an accelerated modernization process and enhanced competitiveness in the global economy, companies will continue to make a huge financial investment in the telecommunications industry, at least until the end of the 1990s. In fact, in a study made public in mid-1995, Northern Telecom estimates the market will reach U.S.\$31 billion by the year 2000 (including equipment, service, and infrastructure) and that more than 230,000 people will be working in the sector. The estimates assume 20 telephone lines for every 100 people, more than twice the number in 1995. As with AT&T in the United States, even though Telmex will lose market share as a result of competition, it is expected to continue to grow.

In response to competition, Telmex is raising issues such as reciprocity on the part of the United States for entry into its markets. As a result, Telmex won the right to provide direct long-distance service to clients in the United States. This is especially significant because 65 percent of Telmex traffic with the United States is to SBC territory. Also indicative of the increasing global competitive pressure, the president of Telmex, Carlos Slim Helu, argues that the controversial Telmex-Televisa deal between specialists in telecommunications and production "represents a necessary strategic alliance of two Mexican companies that are preparing to compete in improved conditions with the major transnationals that are coming to Mexico because of globalization and could easily take over the domestic market" (*El Financiero International* 1995).

What originated as the cornerstone of the Salinas administration's drive for domestic modernization may well emerge as the gateway for Zedillo's team to position Mexico in the vanguard of those exploiting the infobahn, leading Latin America in the Global Information Infrastructure (GII). Initiatives evolving from the Summit of the Americas held in Miami in December 1994 indicate that there is growing interest in coordinating a Latin American agenda for information infrastructure. The broad themes of the event—hemispheric economic integration, sustainable development, and reinventing government—will all be more easily attained via an efficient and well-coordinated information infrastructure. Mexico is well positioned to set a national technical and political agenda to serve as a model for the region.

Regional model or not, information infrastructure is considered essential for the social reforms demanded of the Zedillo administration. Zedillo strategists are mapping out a game plan for intragovernmental networks linking directly into the GII. In particular, widespread access and participation could be attained through establishment of a national satellite network within the country's 260-campus technical training institute, Conalep. Conalep provides students with a competency-based education in computers and therefore offers a vehicle for the concept of networking to be integrated at both the administrative and educational levels.

Entering the twenty-first century with widespread GII access and participation will further domestic reforms in other sectors. The opening of the telecom monopoly in January 1997 and the expansion of value-added services provides more

competitive prices and services for the growing economy. For example, Telmex has acknowledged that it will have to cut long-distance rates up to 25 percent to compete in the open market. The 1994 elections showed the sophistication of the extensive automation of PRI's campaign headquarters, as well as the Federal Electoral Institute's (IFE) reliance on information technology for a more accurate and accountable election.

13.11 Conclusion

Several interrelated domestic factors, intensified by competition in the international economy, spawned a radical change in telecommunications policy in Mexico after 1988. The inability of the government-controlled public telephone monopoly to provide even basic service, let alone accommodate demand for new and improved telecom infrastructure and services, exacerbated by inefficient management of the government-owned national satellite system, were key factors providing impetus for change. The desire for accelerated modernization created a momentum that led to restructuring telecom agencies, reinterpreting and rewriting communications law, reprivatizing the telephone company, and now privatizing the satellite system. In fact, the political impetus behind revolutionizing Mexico's marketplace over the past two years stems from the deep belief that without boosting the telecommunications sector, NAFTA would never take off. Furthermore, the deregulation of equipment and liberalization of value-added services arising from NAFTA provides an additional catalyst to Mexico's participation in the information revolution. Perhaps most important, the 1995 economic crisis awakens Mexican policy makers to the need for a development plan that is sustainable. In the words of Telmex Director-General Jaime Chico Pardo, "You cannot run a country just on economic models: you must respond to social realities." There is no doubt the role of telecommunications will be important.

Notes

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1. *Maquiladoras*, or "in-bond" industries, are assembly plants operating under a program that permits duty-free entry of parts and supplies into Mexico. Most of the output is exported to the United States, which charges a duty only on the value added in Mexico—generally only the labor cost of assembly. Relatively inexpensive and plentiful labor makes this setup appealing for certain types of operations. Exports from these plants soared from just below U.S.\$2.5 billion in 1980 to over U.S.\$26.2 billion in 1994. The program will ultimately become obsolete due to NAFTA, and the sector will disappear by the year 2001.

2. When Madero attempted to correct the illegal situation of giving certain foreign investors favorable exemptions, such as a minimal obligation to pay taxes, representatives of these interests joined with the Porfirian army and the Mexicans defeated by the Revolution to assault the government and, on February 22, 1913, assassinate Madero. The U.S. Embassy served as a headquarters for the foreign interests.

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Acronyms

AT&T	American Telephone and Telegraph
BANACCI	Holding company for Banamex
BANAMEX	Banco Nacional de Mexico
BANCOMEXT	Banco de Mexico (Mexico's import/export bank)
BANOBRAS	Banco Nacional de Obras Publicas (Mexico's infrastructure bank)
CEICO	Telmex's telephone attention centers providing custom service and sales by phone
CEPAL	Comision Economica Para America Latina y el Caribe
CETES	Certificados de la Tesoreria de la Federacion
CFE	Comision Federal de Electricidad
COMPEX	Comision para la Promocion de las Exportaciones
DID	Direct inward dialing
FCC	Federal Communications Commission
GATT	General Agreement on Tariffs and Trade
IIT	International Telephone and Telegraph
NADBANK	North American Development Bank
NAFINSA	Nacional Financiera (Mexican finance bank)
NAFTA	North American Free Trade Agreement
OECD	Organization for Economic Cooperation and Development
PEMEX	Petroleos Mexicanos (Mexico's state-owned oil company)
PFIC	Programa de Fomento de la Industria de Computo (Computer Industry Industrial Development Program)
PMIC	Programa de Modernizacion de la Industria de Computo (Computer Industry Modernization Program)
PRI	Partido Revolucionario Institucional (Mexico's Institutional Revolutionary Party, in power for almost seventy years)
RDI	Red Digital Integrada (Integrated Digital Network)
SCT	Secretaria de Comunicaciones y Transportes (Secretariat of Communications and Transportation)
SECOFI	Secretaria de Comercio y Fomento Industrial (Secretariat of Commerce and Industrial Development)

